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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/530,934	05/05/2000	KLAUS HUBER	2345/129	5127
26646	7590	04/05/2004	EXAMINER	
KENYON & KENYON ONE BROADWAY NEW YORK, NY 10004			TRAN, KHANH C	
			ART UNIT	PAPER NUMBER
			2631	8

DATE MAILED: 04/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/530,934

Applicant(s)

HUBER, KLAUS

Examiner

Khanh Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 16-56 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-56 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. The Amendment filed on 01/12/2004 has been entered. Claims 16-56 are pending in this office action.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 16-28 have been considered but are moot in view of the new ground(s) of rejection.

3. Regarding to the rejection claims 22-23 under 35 U.S.C. 112, first paragraph, the rejection is still maintained because the specification lacks disclosure of the subject matters "a code over Gaussian integers modulo of a Gaussian number" and "a code over Eisenstein-Jacobi integers modulo of a Eisenstein-Jacobi number" to enable one of ordinary skill in the art to make or use the claimed invention.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 22-23 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for "Gaussian integers modulo a Gaussian number" and "Eisenstein-Jacobi integers modulo an Eisenstein-Jacobi, does not reasonably

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provide enablement for a block code including a code over the claimed features. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

The specification does not disclose the claimed subject matters "a code over Gaussian integers modulo of a Gaussian number" and "a code over Eisenstein-Jacobi integers modulo of a Eisenstein-Jacobi number".

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 16, the phrase "and/or" and "and/or" in line 5 of said claim renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

6. Claims 28-29, 32, 44-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 28-29, 32, 44-45 the phrase "and/or" and "and/or" in line 7 and 8 of said claim renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

7. Claims 33-43 are also rejected due to dependency on claim 29 or 32.

8. Claims 46-56 are also rejected due to dependency on claim 44 or 45.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 16-17, 19 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Calderbank et al. U.S. Patent 5,115,453.

Regarding claim 16, as stated in the last Office action and recited here, Calderbank et al. invention is directed to a communication system where a signal constellation is used for data communications.

The communication system utilizes a multi-dimensional signaling scheme. Figure 1 illustrates a transmitter in a data communications system wherein signal points in the signal constellation are selected to represent incoming data for

transmission data through channel. Figure 2 illustrates one of four identical 2-dimensional signal constellations constituting an 8-dimensional signal constellation, which is used to communicate data in accordance with Calderbank et al. patent. Hence, multi-dimensional signaling scheme is a multi-level modulation process.

Furthermore, constellation points are plotted on in-phase (I) and quadrature-phase (Q) axes, which are an orthogonal basis function. In claim 18, Calderbank et al. patent (see column 12, lines 38-52), claims a method for transmitting data comprising a step of selecting signal points in a signal constellation in accordance with a predetermined signal point probability distribution in which the selection of signal points within any region is equally probable. Calderbank et al. discloses that by choosing the probability distribution in a prescribed manner, the shape gain of the signal constellation in that manner is substantially increased (optimized) while peak-to-average-power ratio (PAR) is desirably decreased wherein each of the selected signal points has a defined energy.

Regarding claim 17, as recited in claim 16, constellation points are plotted on in-phase (I) and quadrature-phase (Q) axes on each 2-dimensional signal constellations. Hence, the source coder 111 employs an orthogonal basis function in the coding process for adapting a data sequence of the signal.

Regarding claim 19, referring to figure 1, the transmitter 10 includes a Trellis encoder 118. The Trellis encoder 118 introduces redundancy to allow the use of maximum likelihood decoding technique. Hence, Trellis encoder 118 includes error-correcting code adapted for the modulation process. Furthermore, a channel encoder 132 maps the ensemble of signal points into four corresponding pairs of in-phase and quadrature-phase amplitudes. Output of the channel coder is applied to modulator 141. The channel encoder acts as claimed second data source to perform channel-encoding data bits before transmission through the channel.

Regarding claim 24, referring to figure 1, the transmitter 10 includes a scrambler 104 to scramble data bits.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 18, 20-21, 25-28, 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calderbank et al. U.S. Patent 5,115,453.

Regarding claim 18, Huffman coding is well known in the art and is described in numerous communications textbooks. Utilization of Huffman coding in the source coding would have been obvious to one of ordinary skill in the art.

Regarding claim 20, block code is well known in the art for error correction. Utilization of block code for error correction capability would have been obvious to one of ordinary skill in the art.

Regarding claim 21, convolution code is well known in the art for error correction. Utilization of convolution code for error correction capability would have been obvious to one of ordinary skill in the art.

Regarding claim 25, one of ordinary skill in the art will appreciate that data rate of transmission channel must be greater than data rate of data stream due to limitation of transmission channel capacity. Hence, it would have been obvious for one of ordinary skill in the art to select data rate of the data stream smaller than data rate of transmission channel.

Regarding claim 26, as well known in the art, synchronization between the transmitter and receiver must be established before actual transmission. Hence, synchronization is performed when no data bits are present in the signal when a system is initialized.

Regarding claim 27, as well known in the art, signaling procedure between the transmitter and receiver is performed at the beginning before any actual data



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transmission. One of ordinary skill in the art will appreciate that the transmitter would transmit housekeeping data and user data during signaling procedure.

Regarding claim 28, said claim is rejected using similar rejection argument as in claim 1 to address the selection of signal points of a signal constellation as claimed in the pending patent application. Furthermore, referring to figure 1, the transmitter 10 includes a data source 101, a source coder 111, a modulator 141, and a transmission channel 15. Figure 3 illustrates a receiver 30 includes a Viterbi decoder 331, a source decoder 350, and a data sink 371.

Calderbank et al. does not expressly disclose a recoder and an inverse recoder as claimed. As disclosed on page 3 lines 5-11 of Applicant's specification, a recoder 3 then ensures that a modulator 4 selects the corresponding signal points with the correct probability. Referring back to figure 1, the source coder performs the selection of signal points with a predetermined signal point probability distribution and source coding before the modulator 141. It would have been obvious for one of ordinary skill in the art the source coder as taught by Calderbank et al. is equivalent to the recoder as claimed because the source coder and the claimed recoder perform equivalent function. In light of the foregoing reason, the source decoder is equivalent to the claimed inverse recoder.

Regarding claim 30, as known in the art of communications, output of the modulator 141 is buffered before transmission.

Regarding claim 31, one of ordinary skill in the art will appreciate that buffering stores data in a temporary buffer.

### ***Allowable Subject Matter***

11. Claims 29, 32, 44-45 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

12. Claims 33-43 and 46-56 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

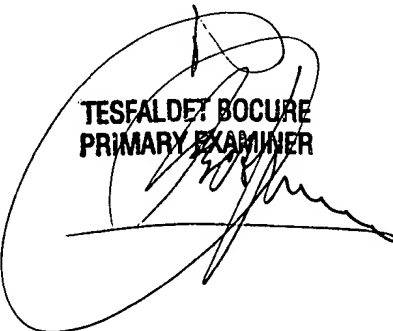
Ashida U.S. Patent 4,801,899 discloses "Quadrature Amplitude Modulation/Demodulation Device Using Multi-level Digital Signals.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Tran whose telephone number is 703-305-2384. The examiner can normally be reached on Tuesday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 703-306-3034. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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PRIMARY EXAMINER